

Notice of Allowability

Application No.

10/656,518

Examiner

Ted Kim

Applicant(s)

VENKATARAMANI ET AL.

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 02/28/2005.
2. ☒ The allowed claim(s) is/are 1-13, 15-19.
3. ☒ The drawings filed on 05 September 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 04/11/2005
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Robert Reeser on 4/18/05.

The CLAIMS of the application has been amended as follows:

1. (currently amended) A method for assembling a turbine engine to facilitate preventing ice accumulation on the turbine engine during engine operation, the gas turbine engine including a fan assembly, a booster downstream from the fan assembly, and a high pressure compressor downstream from the booster, the booster including an inlet guide vane assembly, at least one splitter, and an outlet guide vane assembly, said method comprising:

coupling at least one heat pipe to the engine such that a first closed end of the at least one heat pipe is coupled in thermal communication with a heat source; and

coupling a second closed end of the at least one heat pipe in thermal communication with ~~an outer surface of an engine component that is upstream from the heat source, and positioned~~ within at least one of the inlet guide vane assembly and the outlet guide vane assembly that is prone to icing, such that fluid flows from the first end to the second end of the at least one heat pipe, and in an opposite flow direction from the second end to the first end of the at least one heat pipe through the at least one heat pipe to facilitate preventing ice accumulation on the engine component outer surface an outer surface of at least one of the inlet guide vane assembly and the outlet guide vane assembly that is prone to icing.

6. (currently amended) An ice protection system for a turbine engine, said ice protection system comprising at least one heat pipe coupled in thermal communication between a heat source and an outer surface of at least one engine component that is prone to icing, the turbine engine including a fan assembly, a booster downstream from the fan assembly, and a high pressure compressor downstream from the booster, the booster including an inlet guide vane assembly, at least one splitter, and an outlet guide vane assembly, said at least one heat pipe comprises a first closed end, a second closed end positioned within at least one of an inlet guide vane assembly and an outlet guide vane assembly, and a body extending therebetween, said body has a cross-sectional flow area that is sized to enable fluid to flow in a first direction from the first end to the second end therethrough and in a second direction from the second end to the first end therethrough during engine operation, said ice protection system facilitates at least one of preventing and mitigating ice accretion across ~~the engine component outer surface~~ an outer surface of at least one of the inlet guide vane assembly and the outlet guide vane assembly that is prone to icing.

13. (currently amended) A gas turbine engine comprising:

a fan assembly, a booster downstream from the fan assembly, and a high pressure compressor downstream from the booster, the booster including an inlet guide vane assembly, at least one splitter, and an outlet guide vane assembly,

a stator assembly comprising an external surface of at least one of the outlet guide vane assembly and inlet guide vane assembly that is prone to icing;

a heat source downstream from said stator assembly; and
an ice protection system comprising at least one heat pipe coupled in thermal communication between said heat source and said stator assembly outer surface, said at least one heat pipe comprises a first closed end, a second closed end positioned within at least one of an inlet guide vane assembly and an outlet guide vane assembly, and a body extending therebetween, said body has a cross-sectional flow area that is sized to enable fluid to flow in a first direction from the

first end to the second end therethrough and in a second direction from the second end to the first end therethrough during engine operation, said ice protection system facilitates at least one of preventing and mitigating ice accretion across the outer surface of at least one of the inlet guide vane assembly and the outlet guide vane assembly that is prone to icing.

- Claim 14 has been canceled.

REASONS FOR ALLOWANCE

2. The following is an examiner's statement of reasons for allowance: the prior art of record do not fairly teach in permissible combination the claimed invention. In particular, newly cited GB 2,136,880 was brought to the Examiner's attention as being cited in a copending foreign application and the heat pipe 22 is taught as heating along its length (page 1, line 116-124), hence it would facilitate heating any stator assembly 20 as well as 27. Pierce teaches heating the inlet assembly of a gas turbine engine with fan 50, booster assembly with stator (unlabeled) and heat from the gearbox via lines 86, 84 is taken to deice the intake. Combining Pierce with GB '880 would teach using the heat pipe of GB '880 to heat the stator assembly of the booster assembly as well as the engine intake. However, the second end of the heat pipe would not be taught to be within the stator assembly which includes the intake guide vane assembly or outlet guide vane assembly. Furthermore, it is now explicitly made clear that the system will deice portions of the engine that are prone to icing.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 703-872-9306 for Regular faxes and 703-872-9306 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler, can be reached on 571-272-4834.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>

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|  Ted Kim | Telephone | 571-272-4829 |
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| April 18, 2005 | Fax (After Final) | 703-872-9306 |
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